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ABSTRACT

Piaget systematically attempted to relate cognitive, moral, and emotional development in infancy, childhood, and adolescence. In his view, cognitive and emotional development show parallel, complementary courses of development, with cognition providing the structure and emotion the energy of development. Just as children go through stages of cognitive development, they likewise display emotional development that can be thought of as containing qualitatively new emotional expressions and experiences which are characteristic of different levels of development. Although emotional development is closely tied to cognitive development in infancy, it appears to be more closely related to moral and social development in childhood and adolescence. This paper (1) briefly summarizes Piaget's explicitly held position on the relationship between emotional, cognitive, and moral development; (2) presents a reconstruction of Piaget's data on infants', children's, and adolescents' emotions; and (3) compares Piaget's explicit theoretical statements about emotional, cognitive, and moral development with the reconstruction of his database. It is concluded that Piaget's "data" support his theoretical claims, and that the close connection between cognitive and emotional development during infancy paves the way for the equally close link between emotional and moral development during childhood and adolescence. (RH)

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PIAGET'S MODEL OF EMOTIONAL DEVELOPMENT

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"One may say, to begin with, that in a certain sense neither logical nor moral norms are innate in the individual mind. We can find, no doubt, even before language, all the elements of rationality and morality. Thus sensori-motor intelligence gives rise to operations of assimilation and construction, in which it is hard to see the functional equivalent of the logic of classes and of relations. Similarly the child's behavior towards persons shows signs from the first of those sympathetic tendencies and affective reactions in which one can easily see the raw material of all subsequent moral behavior. But an intelligent act can only be called logical and a good-hearted impulse moral from the moment that certain norms impress a given structure and rules of equilibrium upon this material. Logic is not co-existensive with intelligence, but consists of the sum-total of rules of control which intelligence makes use of for its own direction. Morality plays a similar part with regard to the affective life."(p. 398, MJC)

Piaget is one of the few developmental theorists who has made fairly systematic attempts to relate cognitive, moral and emotional development in infancy, childhood and adolescence. Therefore, it is of interest to reconstruct what Piaget has said about emotional development, and to integrate the resulting outlines of a theory of emotional development with other theoretical traditions and currently ongoing empirical work.

In this paper, Piaget's explicitly held position on the relationship between emotional, cognitive and moral development is briefly summarized. Then Piaget's "data" on infants', children's and adolescents' emotions are presented. The findings are the result of a search of Piaget's writings on cognitive and moral development for the emotional reactions he attributes to infants, children and adolescents, and for the contexts in which they are displayed. Finally, Piaget's explicit theoretical statements about emotional,

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cognitive and moral development are compared with the reconstruction of his "data-base".

THE THEORY

According to Piaget, cognitive and emotional development show parallel, complementary courses of development, cognition providing the structure and emotion the energy of development. Piaget characterizes the stages of emotional development in analogy to the stages of cognitive development. He describes two primary developmental trends in the emotional domain during infancy. First is the internal differentiation of emotional expressions and feelings as exemplified by the gradual differentiation of children's cries of anger and sadness and by the multiplication of feelings the infant develops toward its own successes and failures. The second emotional development during infancy is more closely linked to infants' cognitive development. Parallel to their formation of concepts of objects, space, time and causality, infants move from displaying reflex-like affects and fleeting affects toward more stable, long-lasting affects.

The trend toward more enduring emotional relationships and representations of other people between the fourth and sixth substages of sensorimotor development prepares for the emergence of representational affects, which Piaget considers characteristic of the preoperational or intuitive phase of emotional development. Just as children develop cognitively during this stage, they develop emotionally and can remember emotions longer, even in the absence of the conditions normally eliciting them. Piaget argues that children can experience feelings of inferiority and superiority regarding themselves, and sympathy and antipathy toward others, only when they have attained these symbolic capacities. In other

words, feelings of self-esteem and longer-lasting attachments toward peers and caretakers are a qualitative change in the emotional domain during this period of development. However, just as children's cognitive abilities at this level of development are characterized by fluctuation, inability to attend to more than one dimension at a time, and transductive reasoning, children can focus on the experience of only one emotion at a time. This leads to fluctuations in their expression and experience of emotions toward the people with whom they have formed attachment relationships. They can go from being totally angry at their peers or caretakers to being very affectionate and vice versa.

The integration or conservation of conflicting emotional tendencies becomes possible only when children are capable of concrete emotional thinking and feeling, which is characterized by the emergence of logical operations that allow for the coordination of different people's social and cognitive perspectives, different physical dimensions, and the formation of higher-order categories. Parallel to these cognitive changes, children develop what Piaget calls "moral sentiments"; that is, feelings of justice, honesty, and the like as qualitatively new feelings in the emotional domain. At the heart of these affects is the integration or coordination of different people's interests and perspectives. The child's internal equivalent to coordinating different social perspectives is the development of a system of values that allows for the integration of conflicting feelings children may have about themselves and others. Piaget calls this ability to coordinate conflicting feelings the 'will', or the emotional operation that corresponds to children's cognitive operations emerging at the same time. Analogous to children's cognitive operations, their values or conserved emotional tendencies remain tied to the here and now, that is, they are not completely

detached from concrete situations. Furthermore, just as children's logical grouping at this developmental level lacks complete integration, their value systems are not completely integrated. This lack of integration results in the inconsistent treatment of people and situations.

Piaget believes that only during the last stage of cognitive and emotional development are children capable of reasoning and feeling with respect to abstract contexts. Just as they begin to think scientifically by constructing theories about the physical world and testing them, they begin to coordinate completely their feelings about others, themselves, institutions, and the world in general in terms of a system of values that is the moral and emotional equivalent to the construction of theories about the physical world. This integrated system of values manifests itself in ideological feelings with respect to social and ideal realities (personal relationships, institutions, and nations). Intrapsychically it is the organization of personal identity. In sum, Piaget claims that just as children go through stages of cognitive development, they display emotional development that can be conceived of in terms of qualitatively new emotional expressions and experiences characteristic of different levels of development.

THE DATA

I will now present some of Piaget's data on emotional development, and relate them to his theoretical statements. We do not have enough time to go over all of Piaget's observations of children's emotions, however, this hand-out may help you to follow some of my summarizing statements about infancy. The tables are taken from an article I wrote with Dante Cicchetti several years ago.

As to infants' emotional development, there is indeed support for the internal differentiation of expressions and feelings. Table 5.3 shows that

infants do have a considerable range of emotional expressions. Piaget describes smiling, crying, laughter, anger, excitement, satisfaction, contentment, interest, curiosity, delight, astonishment and anxiety as characteristic of the first three months of life. The table also documents that infants' emotional repertoires develop. For example, Piaget uses amusement, delight, desire, disappointment, resentment and pretend crying only to describe older infants' emotions suggesting that infants' emotional expressions do in fact change. Table 5.3 also implies that infants' feelings become differentiated, because they are expressed and experienced in a growing number of situations. For example, while Piaget detected the first signs of rage at 1 month and 15 days in a situation in which one of his children encountered a discrepant event, he discovered it for the first time at 4 months 12 days in a familiar situation. Similarly, crying first occurs in response to discrepant events, and only later in situations associated with competence and mastery, and finally in familiar contexts.

Infants also seem to change from displaying reflex-like, fleeting affects to longer-lasting representational affects in the course of the first two years of life. The already mentioned pretend crying is a case in point. At 19 months, one of Piaget"s children says "cry, cry" to a dog and imitates the sound of crying. Related examples are laughter at 18 months when Piaget imitates the infant's crying, and laughter at 21 months when the infant is pretending to be Piaget. All of these situations share that the infant needs to have an image or a representation of the situation or feeling s/he is pretending in order to be able to be amused by the similarity or discrepancy between the image and the act of pretend. It can be concluded that Piaget's data on infants' emotions lend support to his theoretical claims about emotional developments during the sensori-motor stage.

To move on to Piaget's conception of preoperational emotional development, he suggests that young children are capable of more stable feelings about themselves and others as soon as they are capable of more symbolic or representational affects. Piaget's books on young children's cognitive development lend threefold support to these theoretical claims. As the examples in table 5.1 reveal, children experience and display affect in increasingly complex situations attesting to their object and person permanence. For example, at 15 and 18 months they are amused about finding objects in or putting them into various objects or places. Or, they are astonished when failing to take into account the spatial relations of objects with respect to one another; and, at 18 months about the unexpected displacements of objects and people. In other words, by the time children are preoperational, they clearly have feelings about the permanence or lack of permanence of physical objects and people.

Furthermore, as tables 5.1. and 5.4 document, children have feelings in response to a growing number of challenges to their sense of competence. For example, at 14 and 15 months they show delight when comprehending the means/end relations and other spatial relations of objects, and anger at 16 months when failing to make a long series of blocks stand. In addition to experiencing and seeking more challenges to their sense of mastery, children's memory for their performance improves, and they have a better understanding of their own permanence. As a result, preoperational children should be capable of feelings of self-esteem such as inferiority and superiority.

In line with the quote I read to you at the beginning, Piaget conceives of emotional development beyond infancy as moral development. As a result, it is not surprising that <u>The Moral Judgment of the Child</u> is his only

book on development beyond infancy that is filled with references to emotions. However, while Piaget talks a lot about children's moral feelings in the Moral Judgment of the Child, he does not rely on direct observations of children's emotional expressions to infer their moral and emotional competence. As a result, I cannot present you with any data on children's later emotional and moral development, but have to rely on Piaget's interpretations instead.

What does Piaget say about preoperational children's emotional and moral development? He suggests that young children's enjoyment of their own movement, especially the pleasure they experience when ritualizing some of their sensori-motor activities is at the heart of their internalization of rules. According to Piaget, feelings of obligation become possible only if the child has developed a sense of regularity. In addition, he stresses the mystical nature of young children's respect for rules and obedience. "Just as the mystic can no longer dissociate his own wishes from the will of his God, so the little child cannot differentiate between the impulses of his personal fancy and the rules imposed on him from above" (p. 58, MJC). The blurring of children's own feelings and others' feelings is an outgrowth of their egocentrism. Their unilateral respect and their objective sense of responsibility are the result of their admiration and respect for their parents, older children and other people their senior. Due to their awe and respect of the older generation, children experience all rules as sacred and eternal. As a result, they are hostile to innovation and believe that rules are untouchable.

This sketchy presentation of preoperational children's emotions suggests that a more interpersonal, moral set of experiences succeeds the emotions of infancy. It also lends some support to Piaget's theoretical claim

that young children's emotions fluctuate and lack integration. For example, the mysticism suggested by Piaget implies confusions between the child's own and other people's emotions. As documented in Piaget's analysis of children's marble games, children cannot compete or cooperate at this stage, that is they cannot coordinate their thoughts and feelings enough to play together suggesting a lack of integration. Furthermore, children's unilateral respect of rules indicates a certain rigidity. It may be true that they can focus on only one feeling about a rule at a time. Finally, given children's admiration for their elders and their attempts to emulate older people, their feelings should change depending on the person they are with.

In sum, preoperational emotional development can be characterized in terms of feelings of self-esteem and feelings about other people that are still unstable and lacking in complexity. Some of these new feelings of the preoperational stage are moral feelings of respect, obligation and responsibility.

The integration or conservation of conflicting feeling tendencies, the coordination of different people's interests and perspectives, and the development of truely moral sentiments become possible only during the concrete operational stage. In The Moral Judgment of the Child, Piaget describes "children's increased desire for mutual understanding", their "felt need for understanding", the "specific pleasure if games become social", or "if games are played in common" (all p. 42, MJC). A variety of correlated changes occur. Children begin to enjoy social interactions more, they cooperate more, they become more generous because they practice more reciprocity, and the rules of the games they play are based on mutual consent and respect. In the process, the rules of the game become more rational and changeable. They are no longer sacred and eternal.

Piaget attributes these changes in children's moral feelings to a logic inherent in their development. For example, he describes mutual respect as an "equilibrium toward which unilateral respect is tending", and cooperation as an "equilibrium toward which constraint is tending"(both p. 96, MJC). In a similar fashion, he considers children's beginning sense of autonomy as a necessary outgrowth of their increased cooperation and respect: "How does the child ever attain to autonomy proper? We see the first signs of it when he discovers that truthfulness is necessary to the relations of sympathy and mutual respect"(p. 196, MJC). The ultimate law or principle propelling children's tendency to experience the new moral feelings of solidarity and generosity, self-sacrifice, autonomy and mutual respect is justice. Piaget describes justice as "a sort of immanent condition of social relationships or a law governing their equilibrium. And as the solidarity between children grows, we shall find this notion of justice gradually emerging in almost complete autonomy"(p. 198, MJC). It is apparent in this brief summary of children's concrete operational emotions how children's new moral feelings are related to their improved ability to integrate their own and other people's perspectives and feelings. The will, postulated by Piaget as the emotional operation that corresponds to children's cognitive operations may be nothing more than children's internalized experience of justice or the moral law.

According to Piaget's theoretical statements about emotional development, children's moral feelings during the concrete operational stage are still tied to the here and now, and their feelings lack complete integration into a value system. These limitations are overcome during the emotional equivalent of formal operations. Piaget suggests that at around 12 years of age children begin to be interested in the legislation of the games

they play. They "take pleasure in juridical discussions, whether of principle or merely of procedure"(pp. 42/43, MJC). They are "interested in the rules themselves", and they "enjoy complicating things at will"(both p. 50, MJC). They also "take a peculiar pleasure in anticipating all possible cases and in codifying them"(p. 49, MJC). In the process, young adolescents' "group feeling" becomes "more directed and more consciously cultivated", their "moral solidarity", their "sense of equality" and their "feelings of equity" (all p. 320, MJC) become much stronger than they are in any of the younger children.

In the course of negotiating an explicit and shared system of rules with their peers, young adolescents define their personal system of values and their sense of identity. Piaget's claim makes sense that adolescents' feelings are more abstract and become attached to institutions, society, the world and themselves not only in the here and now, but across time. As they agree on a shared set of rules that incorporates everybody's feelings and perspective, the rules are bound to become more universal. They no longer apply just to individuals, but also to mankind as a whole.

In conclusion, we could see that Piaget's "data" support his theoretical claims about the relationship between emotional, cognitive and moral development. Justice emerges as the organizing principle of emotional development in similar ways in which logic structures cognitive development. Emotional development seems more closely tied to cognitive development in infancy, while being more closely related to moral and social development in childhood and adolescence. However, it is also apparent that infants' tendency to express emotions in recognition of similarity and discrepancy, and in response to success or failure continues into childhood and adolescence. Furthermore, Piaget's account implies that without

recognition of similarity and discrepancy, and a sense of mastery, children would not be able to recognize rules nor to practice them. As a result, it can be concluded that the close connection between cognitive and emotional development during infancy paves the way for the equally close link between emotional and moral development during childhood and adolescence.

MJC- Piaget's 'The Moral Judgment of the Child'. N.Y., The Free Press, 1965

from: P. Hesse & D. Cicchetti (1982). Perspectives on an integrated theory of emotional development. In: D. Cicchetti & P. Hesse (eds.) New Directions for Child Development, Vol.16, Emotional development. San Francisco; Jossey-Bass.

Table 1. Piaget's Stages of Cognitive Development in Relationship to Emotional Development

Cognition	Emotion
sensorimotor development: 1) reflexes, experience leads to changes in schemata 2) primary circular reactions: coordination of schemata (visual/auditory, sucking/grasping), capacity to reenact schemata 3) secondary circular reactions: attempt to repeat actions that have led to interesting results 4) coordination of secondary schemata: emergence of goal-directed behaviors 5) tertiary circular reactions: attempt to create new action patterns 6) invention of new means through mental combinations	1) affective reflexes (in case of loss of balance, or striking contrast between chance event and the infant's position or posture) 2) elementary feelings, perceptual affects, linked to modalities of own activity: pleasure, displeasure, joy, pain, success, failure 3) object choice: objectivation of feelings and projection on activities other than the ones of the subject (decentration from focus on own body to choice of object, fixation of affectivity on the mother); feelings linked to own activities become differentiated and multiplied: joy, sadness about success and failure, intentional acts, interindividual feelings begin
intuitive, preoperational thought: • symbolic functions, representations • thought tied partly to language, rests on interindividual communications, no longer just individual • preconcepts in verbal and nonverbal classifications and orderings: fluctuating, private, one-attribute-at-a-time groupings • reasoning transductive, from particular to particular	representational affects: tied to interindividual values, values subsisting outside of the visual field: sympathy, antipathy / superiority, inferiority / schemata of reaction to objects and persons schemata of submission, obedience, revolt, unilateral respect for parents (obedience): motives bound up with subjective or personal impressions
concrete operational thought: • coherent integrated cognitive system • characterized by operations as opposed to preoperational thought which is characterized by intuitions • beginning to extend thinking from the actual towards the potential • are concrete, i.e. their structuring and organizing activity is oriented towards concrete things and events in the immediate present • the fact that the concrete-operational child is still bound to the phenomenal here and now results in a second limitation: he has to learn about the physical properties of objects and events one by one, because his cognitive instruments are insufficiently formal, i.e. insufficiently detached and dissociated from the subject matter they bear upon • the various concrete-operational systems (i.e. logical groupings) exist as more or less separate islands of organization; they do not form a single integrated system	moral sentiments (conservation of values, obligation, the will); morality of reciprocity, feelings of justice, honesty, comradery, interindividual affects
formal operational thought: • hypothetico-deductive • propositional • combinatorial / derivation of hypotheses, construction of theories and ideologies	• ideological feelings with respect to social, ideal realities (about one's country, humanitarianism religious feelings) added to interindividual feelings; motivations adjusted to certain collective ideals, e.g. the national community, neutrality, freedom, charity, social justice, freedom of conscience, civic, intellectual courage • personality: "superior synthesis of affective life" allowing the individual to group and regulate the whole of his values, developed in relation to social rules and scales of values derived from social interactions (life plan)

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from: D. Cicchetti & P. Hesse (1983). Affect and intellect: Piaget's contributions to the study of infant emotional development. in: R. Plutchik & H. Kellerman (eds.) Emotion. Theory, research, and experience. Vol.2. Emotions in early development.

TABLE 5.1
Classification of the Contexts in Which Piaget Uses Emotions to Infer Cognitive Competence in Infancy

Infant's age in months	*Stage of sensorimotor development*	*Classification of situations, and the emotional characteristics of them at different levels of development*			
		Proprioceptive–kinesthetic reaction	*Recognition of similarity*	*Competence*	*Recognition of discrepancy*
0–3	I reflexes II primary circular reactions	0.1 crying when hungry, when other infants cry 1 smiling when hearing voices and *pa* and *bez* sounds 1 excitement when sucking (expressed by panting) 2 joy when throwing head back repeatedly 2 laughter when leaning head back 2 anger when hunger becomes persistent 2 desire when hungry 3 crying when hungry and in mother's arms	1 satisfaction when infant localizes father (even if immobile) 1,2 smiling when others imitate infant's sounds 2 laughter when recognizing father who is uncombed	1 smiling accompanying own production of sounds 1 contentment when playing with tongue 1 satisfaction when playing with tongue, lip 1–3 smiling about imitations of Piaget's innate sounds, about own hand movements with and without objects, when successfully grasping for familiar objects and causing crib roof to move 2 (function) pleasure when touching own body (nose, hands), and about play with own voice 3 laughter when successfully causing noisy objects to move 3 joy about own hand movements and their increasing coordination 3 interest in playing with own voice 3 pleasure about looking at moving toys, but no connection made between infant's movement and spectacle seen 3 laughter when playing with own voice 3 delight when shaking chain which affects movement of toys	0.1 crying when losing nipple or finger out of mouth 1 rage when feeding is interrupted 1 anger when infant loses its thumb out of mouth, or is prevented by bandage from sucking thumb 1 interest in sounds leading to an attempt at localizing 1–3 curiosity about unusual movements of objects 1–3 surprise about new sounds and new objects 2 fright when failing to recognize uncombed father 2 excitement when watching mosquito net 2,3 interest in various objects, persons, actions, movements of objects and own hands 2,3 astonishment when causing dolls on crib-roof and rattle to move 3 fear of neighbor 3 anxiety when infant confronted with new objects it would like to grasp 3 joy about own hand movements
4–7	III secondary circular reactions	4 crying when hungry and in mother's arms 4 fear when producing a sudden noise 7 smiling when father makes or causes	4 rage when napkin is put under infant's chin indicating upcoming medication 4,6 smiling when Piaget imitates infant's	4 excitement when movement of foot causes movement of doll on crib-roof 4–7 laughter when own actions bring about effects in people or objects or own imitations meet standards of adequacy 4,7 pleasure when making noise with rattle,	4 surprise about moving letter opener with string (means–end relation) 4 fright about unknown objects & too loud noise 4 disappointment about father's disappearance from a place he was expected to be in
		sounds (&c. finger snapping, shaking rattle) 7 laughter in reaction to father's production of new sounds (some involving imitative interactions) 7,8 crying when hungry and hearing the mother's bed creaking or the mother's entering of the room	thumb movements and vocalizations 4,6,7 smiling when recognizing father in various situations 5 interest when father imitates tongue protrusion 6 delight about exchange of reciprocal imitations with mother 6 smiling when father imitates the infant's vocalizations of the day before 6,7 laughter when recognizing father 7 pleasure when mother opens her mouth together with the infant during feeding	when accurately imitating parents' vocalizations 4–8 joy, about own motor capacities 6 contentment about successful turning of matchbox 6 delight when feet reach doll and kick it 6,7 amusement about new effects caused by own hand movements with and without objects 7 crying when failing to get hold of bottle 7 laughter when finding hidden father	4 desire to get objects to suck on them 4 interest when stick strikes toy unexpectedly 4,5,7 astonishment when encountering new objects, hidden objects, new effects and displaced objects 5,6 anger when infant fails to get hold of objects that are too far away 6 curiosity when father is hiding objects 6,7 crying when infant fails to get hold of its bottle 6,7 interest in new effects, distant and partially covered objects 7 desire when father does not snap fingers anymore 7 disappointment when losing box out of hand
8–11	IV coordination of secondary schemata	8 laughter when being tickled 9 laughter when father says cow-cow into infant's ear 10 amusement when pressing gums against each other 10–12 laughter when being tickled	8 desire to make father imitate coughing 8–11 laughter in various contexts in which Piaget imitates the infants or causes dolls on crib-roof to move as done previously 9 smiling about Piaget's imitation of tongue protrusion and *baba* sounds, when realizing that mirror image displays the same movements as the infant 10 delight when father	8 pleasure when establishing link between own arching up and movement of crib-roof 8 smiling when bouncing up and down and trying to get father to open and close the crib-roof 8 crying when not hungry and bib is put around neck 8 anxiety when own actions fail to bring about movement of bottle 8 contentment when bouncing up and down is regularly followed by father's moving of a saucer 8,9,11 laughter about successful handling of means–end relations 8,10 disappointment when realizing that own arching up does not cause father's moving of a saucer	8 fear when Piaget, unseen, causes crib-roof to move, when Piaget moves bell although infant is holding it 8 amusement when putting finger into mouth making noise 8,9 desire for new objects (e.g., moon at evening) 8,9 curiosity when Piaget creates interesting effects, about partially covered objects, when encountering new objects 8,9 laughter when playing peek-a-boo-like games 8,9,10 interest when Piaget opens his mouth without making sounds 8,10 disappointment about objects out of sight, about A-not B error 9 anxiety when noise is too loud (when infant is decreasing then increasing noise of rattle),

(continued)

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TABLE 5.1—*Continued*

Classification of the Contexts in Which Piaget Uses Emotions to Infer Cognitive Competence in Infancy

Infant's age in months	*Stage of sensorimotor development*	Classification of situations, and the emotional characteristics of them at different levels of development			
		Preperceptive–kinesthetic reaction	*Recognition of similarity*	*competence*	*Recognition of discrepancy*
			imitates tongue protrusion 11 interest when Piaget, imitating the infant, sticks his finger into his ear	8,10 pleasure about production of new sounds (snapping of index finger; blowing, breathing noisily) 9 pleasure about lifting itself up, repeating action several times 9 smiling when playing tag, pulling forcefully on watch chain 9 laughter when imitating father successfully 9,10 interest in own hand movements 9,10 amusement about effecting spatial displacements of objects 11 resentment when not searching thoroughly enough for an object displaced by father	when father is pulling watch from infant's hands 9 laughter when father hides objects 9 anger at Piaget when he has hidden a doll 9,11 crying in contexts of separation from persons, objects 9,12 astonishment about empty hands after dropping something, about a partially covered doll 10 laughter when father makes his lower lip shake with his finger 11 interest in new locations of objects 12 amazement when seeing father's face in the mirror 12 delight as father opens and closes match box 12 surprise when recognizing the spatial relations of objects (e.g., two ends of a cane)
12–18	V tertiary circular reactions	13 fear when scratch is disinfected with alcohol 13 crying when seeing the alcohol bottle with which the wound has been treated 13 laughter when father rubs thighs	12 smiling when Piaget makes a doll cry (behind his back) 13 satisfaction when infant realizes movement in its carriage (father's foot is pushing wheel) 14 satisfaction when playing tag with necktie ("game" has been played on previous occasions) 15,16 smiling when recognizing Piaget in garden, when imitating own call of two days earlier 15–18 laughter in various contexts of symbolic activity 16 laughter when infant imitates child's temper tantrum of previous day 18 laughter when Piaget imitates infant's crying	12 satisfaction after having reproduced father's movement of window with foot 13,14,16 pleasure about producing familiar actions in modified contexts 13,15,18 laughter about finding objects under various conditions of spatial displacement 14,15 delight about comprehension of means–end relations and other spatial relations of objects 15 satisfaction when succeeding in imitating father's touching of his forehead 15,18 amusement about finding objects in or putting them into various objects or places 16 desire when hitting flask to draw it closer 16 anger when unsuccessful at making a long series of blocks stand	13–16,18 interest in new objects, unexpected effects, movements of objects with respect to one another 15,16,18 surprise when failing to take into account the spatial relations of objects with respect to one another; about the spatial relations of objects, and about strange behaviors in other people 15,18 astonishment when failing to take into account the spatial relations of objects with respect to one another; about unexpected displacements of objects and people
19–24	VI invention of new means through mental combination		19 saying *cry,cry* to dog, imitating the sound of crying 20 delight when putting shell on table, saying *sitting* 21–22 laughter when pretending to be Piaget and to see a seagull fly	19 pleasure about drinking out of empty glasses 24 laughter when opening window, yelling to fish in bay in garden	20 laughter about creating an unexpected effect 21 smiling about unexpected movements of Piaget's legs that are covered with a blanket

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TABLE 5.2
Infant's Cognitive Competence Inferred on the Basis of Their Emotional Behaviors

Infant's age in months	*Stage of sensorimotor development (including its cognitive characteristics)*	*Cognitive competence inferred from emotion(s)*			
		Proprioceptive–kinesthetic reaction	*Recognition of similarity*	*Competence*	*Recognition of discrepancy*
0–3	I reflexes II primary circular reactions	beginning of object concept: representation of mother as food source	recognition memory: recognition of familiar versus unfamiliar people; facial clues necessary for recognition of people	awareness of exercise of own capacities: vocalizations, tongue; and hand movements, hand coordination conception of effects brought about by the infant's actions on the environment; however, no clear distinctions made between own actions and their effects distinctions can be made between the degree of vigor of the effects	awareness of the negation, and nonexistence of objects or events
4–7	III secondary circular reactions	representation (memory) of mother and her activities in various situations that are related to the provision of food	increased memory capacity: recognition of events that occurred 1 day earlier, and of sounds; partial development of recall memory first establishment of awareness of correspondences or similarities between own and others' behaviors	increasing awareness of remote effects of own actions standards of perfection developed with respect to the infant's own imitations	partial development of the object concept (out of sight still sometimes out of mind) partial development of means–end relations concept of causality still restricted to infant's own actions of hitting and bouncing lack of correct estimate of distance
8–11	IV coordination of secondary schemata		generalization of capacity to detect correspondences between own and others' behaviors emergence of the infant's self-concept beginning capacity to predict events that will take place in the near future	well established object permanence establishment of means–end relations between own actions on objects and the latters' effects on third objects no clear distinction between social and physical causation attempts to control own emotional behaviors	concept of object permanence developed, however, not across spatial displacements awareness of discrepancy between own expectations and actual events in case of the A-not-B error arising awareness of spatial displacements arising notion of different distances growing awareness of the difference between self and other as center of causality

(continued)

TABLE 5.2—*Continued*

Infant's age in months	*Stage of sensorimotor development (including its cognitive characteristics)*	*Cognitive competence inferred from emotion(s)*			
		Proprioceptive–kinesthetic reaction	*Recognition of similarity*	*Competence*	*Recognition of discrepancy*
12–18	V tertiary circular reactions	evidence for recall memory: recognition of an event on the basis of its partial replication	increase in memory capacity: context-independent capacity to recognize people; recall memory for events that occurred 2 days earlier ability to detect abstract similarities, and to use them in the context of symbolic activities precursors of humor precursors of the role concept	concept of object permanence across several spatial displacements developed ability to produce slightly modified effects on objects with or without the help of third objects	awareness that objects can move and influence one another independent of the infant awareness of spatial relationships of objects with respect to one another
19–24	VI invention of new means through mental combinations			awareness of new symbolic capacity to name objects/people and emotional behaviors	

TABLE 5.3
Developmental Sequence of Emotional Behaviors and Inferred Emotions

		Proprioceptive–kinesthetic reaction		*Recognition of similarity*		*Competence*		*Recognition of discrepancy*	
Infant's age in months	*Stage of sensorimotor development*	*Reported for the first time*	*Reported as continuing to be displayed*	*Reported for the first time*	*Reported as continuing to be displayed*	*Reported for the first time*	*Reported as continuing to be displayed*	*Reported for the first time*	*Reported as continuing to be displayed*
0–3	I reflexes II primary circular reactions	crying, 0(1) excitement, 1(1) smiling, 1(2) desire, 2(15) anger, 2(15) joy, 2(20) laughter, 2(21)		smiling, 1(22) satisfaction, 1(22) laughter, 2(26)		contentment, 1(5) satisfaction, 1(6) smiling, 1(30) interest, 2(. . .) (function) pleasure, 2(17) laughter, 3(0) joy, 3(13) delight, 3(14)		crying, 0(12) anger, 1(2) curiosity, 1(7) interest, 1(8) surprise, 1(8) rage, 1(15) astonishment, 2(17) excitement, 2(18) fright, 2(26) anxiety, 3(7) fear, 3(7) joy, 3(13)	
4–7	III secondary circular reactions	fear, 4(15)	crying smiling laughter	rage, 4(12) interest, 5(9) delight, 6(25) pleasure, 7(1)	smiling laughter	excitement, 4(27) amusement, 6(1) crying, 7(0)	contentment pleasure laughter joy	desire, 4(10) disappointment, 4(26)	crying anger curiosity surprise
8–11	IV coordination of secondary schemata	amusement, 10(12)	laughter	desire, 8(10)	smiling laughter delight interest	anxiety, 8(3) resentment, 11(30)	contentment pleasure laughter smiling crying amusement	amusement, 8(14) smiling, 9(27) laughter, 10(7)	interest astonishment fright anxiety crying anger curiosity surprise interest astonishment fear desire disappointment
12–18	V tertiary circular reactions		crying laughter fear	pretend crying, 18(30)	smiling laughter	desire, 16(0) anger, 16(0)	smiling pleasure laughter amusement delight satisfaction	delight, 12(10)	surprise interest astonishment laughter anger
19–24	VI invention of new means through mental combinations			smiling laughter delight	pleasure laughter				smiling laughter

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TABLE 5.4
Combinations ("Structures") of Emotional Behaviors and Inferred Emotions

Infant's age in months	*Stage of sensorimotor development*	*Combinations of emotional behaviors and inferred emotions*	*Contexts in which emotional behaviors and inferred emotions occur*
0–3	I reflexes II primary circular reactions	surprise →° disturbance (1 month)	about deep tones
		fright → smile (2 months)	fright when seeing father uncombed; smile when suddenly recognizing him
		desire → anger (2 months)	when hunger becomes persistent
		interest → smile (3 months)	interest in making dolls move; smile at success of making dolls move
		astonishment → anxiety (3 months)	in the presence of new objects the infant would like to grasp
4–7	III secondary circular reactions	astonishment → fright (4 months)	when given new rubber monkey
		fear → pleasure (4 months)	fear when producing a sudden violent noise; pleasure when moving to make it last
		fright → vague smile (4 months)	when striking rattle violently by chance
		motor pleasure → visual interest (6 months)	motor pleasure when turning box over; visual interest in modifications of an object's appearance
		anger → intense desire (6 months)	anger when Piaget hides bottle in his hand; desire when infant stares at Piaget's hand, but does not try to move it
		surprise → disappointment (7 months)	surprise when the infant loses a box it was holding; disappointment while looking at its empty hand for a long time
		looking attentively → smiling delightedly (7 months)	when father drums with his fingers on a tin box
		howling → crying → stopping to cry → interest (7 months)	howling as soon as nipple disappears from view, when Piaget turns the infant's bottle in all directions; crying when pushing bottle away; stopping to cry when bottle is moved further away; interest when infant extends its hands, when Piaget brings bottle closer
8–11	IV coordination of secondary schemata	great interest → laughter → contentment (8 months)	interest when Piaget gives watch to infant; laughter when Piaget pulls watchchain away, and infant feels resistance; content when exploring place watch disappeared from
		interest +° pleasure → smiling → disappointment → satisfaction (8 months)	interest + pleasure when father brings saucer in front of infant; smiling when saucer passes in front of infant again; disappointment when infant's movement not followed by movement of saucer; satisfaction when infant's movement is followed by movement of saucer
		curiosity → disappointment (8 months)	curiosity when exploring nail of Piaget's thumb; disappointment when looking at other thumb that is too far away
		fear → interest → pleasure (8 months)	fear—interest when Piaget makes crib-roof shake without infant's knowing that he is there; pleasure about success (when infant's arching movements make the crib-roof shake)
		smile → anxiety → fear → pleasure (9 months)	smile–anxiety–fear when noise is slight, then too loud; pleasure when intentionally grading the noise
		interest → resentment (11 months)	interest in father's watch; resentment when looking for watch in place B, but not thoroughly enough

(*continued*)

TABLE 5.4—*Continued*

Infant's age in months	*Stage of sensorimotor development*	*Combinations of emotional behaviors and inferred emotions*	*Contexts in which emotional behaviors and inferred emotions occur*
12–18	V tertiary circular reactions	interest → wailing → stopping to cry (12 months)	interest when trying to reach a cork with a stick; wailing when unsuccessful; stopping to cry when understanding how to use the stick
		surprise + pleasure → smiling (12 months)	when put in front of mirror and seeing double gesture reflection
		surprise → satisfaction (12 months)	surprise when father moves window with his foot; satisfaction when exactly reproducing the phenomenon
		interest → pleasure (16 months)	interest when putting leg through handle of basket; pleasure about repetition and variation of action
		laughter → astonishment → great pleasure → laughter → surprise (18 months)	laughter about own success in finding a ring; astonishment when not finding the ring; great pleasure about finding ring after unfolding father's fingers; laughter when by chance finding the ring; surprise about finding father's hands empty
		astonishment → laughter (18 months)	astonishment about finding father's hand empty after he has withdrawn it from under a garment; laughter about finding object under garment where father left it
		weeping → laughter (18 months)	weeping while calling mother; laughter when Piaget imitates infant in a tearful tone

[a] → means "is followed by."
[b] + means "is displayed at the same time as."